

REMARKS

Claims 1-13 are pending in this application, of which claim 1 has been amended. No new claims have been added.

Claims 1-9, 11 and 13 stand rejected under 35 U.S.C. § 102(a) as anticipated by Applicants' Admitted Prior Art (hereafter, "APA").

Applicants respectfully traverse this rejection.

Before addressing the rejection, a review of the claimed invention is in order.

In the present invention (1) a superconductive high frequency circuit is not placed on the same plane as the planar antenna (antenna patch portion), and (2) the superconductive high frequency circuit and the antenna patch portion are electro-magnetically coupled via space between them. Because the superconductive high frequency circuit does not occupy a surface area having an antenna patch portion, a plurality of patch portions can occupy more area on the plane of an antenna. As a result, an effective area that receives or emits wave per unit area of the antenna will be greater.

Further, high frequency loss of the antenna patch portion can be prevented by using a superconductive material for the patch portion that will improve efficiency of an antenna.

The Examiner urges that page 1, line 32 to page 2, line 30 of the specification teaches the present invention recited in claim 1.

Applicants respectfully disagree. The cited passage states, in pertinent part, that a feeder line passes through a through-hole (via) so as to not directly contact the grounded surface at the

opposite side of the substrate, which is not electro-magnetically coupled. Page 2, lines 1-6 disclose that a “suitable matching circuit or balanced-to-unbalanced line transformer circuit” is used to couple the feeder line and the antenna elements.

This is in contrast to the present invention, in which the planar antenna 1101 is coupled to the superconductive high frequency circuit 1108 electromagnetically via a space, as shown in FIG. 1 and as disclosed on page 4, lines 30-34.

Accordingly, claim 1 has been amended to emphasize that the electromagnetic coupling is “via a space.”

Furthermore, regarding claim 2, the Examiner has urged that page 3, lines 25-32 disclose that the perpendicular distance of the electromagnetically coupled space has a length of not more than $1/4$ of the effective wavelength.

Applicants respectfully disagree. The cited passage discloses that the “matching circuit is formed by a meandering type $1/4$ wavelength parallel coupling line made of an oxide superconductive film.” In contrast, claim 2 recites this coupling is via an “electromagnetically coupled space” having a length not more than $1/4$ of the effective wavelength.

In APA discussed on page 3, lines 33-35 of the instant application, an antenna and a high frequency circuit are placed on the same plane, which makes the area larger for one element of the antenna.

As described above, APA fails to disclose placing a superconductive high frequency circuit on a plane different from the planar antenna, the superconductive high frequency circuit

and the antenna patch portion being electro-magnetically coupled via space between them, in order to improve the efficiency of the antenna. Therefore, the features of the present invention would not be obvious to one of ordinary skill in the art.

Thus, the 35 U.S.C. § 102(a) rejection should be withdrawn.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as unpatentable over APA in view of Zhi-Yuan Shen, "High Temperature Superconducting Microwave Circuits," Astech House, pps. 104-105 (hereafter, "Shen").

Applicants respectfully traverse this rejection.

Shen has been cited for teaching loaded Q valves vs. temperature for two resonators, one made of YBaCuO with a $T_c=92^\circ\text{K}$ and the other made of TlBaCaCuO with a T_c of 101°K .

Shen, like APA, fails to teach, mention or suggest the limitations of claim 1, as amended, from which claim 12 depends.

Thus, the 35 U.S.C. § 103(a) rejection should be withdrawn.

The Examiner has indicated that claim 10 would be allowable if rewritten in independent form. Applicants respectfully defer this action until a FINAL Office Action, if any, is received.

In view of the aforementioned amendments and accompanying remarks, claims 1-13, as amended, are in condition for allowance, which action, at an early date, is requested.


If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

U.S. Patent Application Serial No. 10/790,769
Response to Office Action dated October 18, 2005

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosures: Petition for Extension of Time
Check in the amount of \$450.00

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